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PATENT COOPERATION TREATY

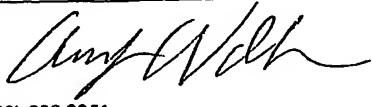
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference SR0019PCT	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US03/25022	International filing date (day/month/year) 08 August 2003 (08.08.2003)	Priority date (day/month/year) 09 August 2002 (09.08.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): C08F 14/18; G03C 1/73 and US Cl.: 526/250; 430/270.1		
Applicant E. I. DU PONT DE NEMOURS AND COMPANY		
<ol style="list-style-type: none"> 1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: <ol style="list-style-type: none"> a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows: <div style="margin-left: 20px;"> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. </div> b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions). 		
<ol style="list-style-type: none"> 4. This report contains indications relating to the following items: <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application </div> 		
Date of submission of the demand 08 March 2004 (08.03.2004)	Date of completion of this report 25 August 2004 (25.08.2004)	
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230	Authorized officer David W. Wu  Telephone No. (703) 308-2351	

Form PCT/IPEA/409 (cover sheet)(January 2004)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US03/25022

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
 - ☒ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1-32 as originally filed/furnished
 - pages* NONE received by this Authority on _____
 - pages* NONE received by this Authority on _____
 - ☒ the claims:
 - pages 33-42 as originally filed/furnished
 - pages* NONE as amended (together with any statement) under Article 19
 - pages* NONE received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the drawings:
 - pages NONE as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets/figs. _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to the sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets/figs. _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US03/25022

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-45	YES
	Claims NONE	NO
Inventive Step (IS)	Claims 1-45	YES
	Claims NONE	NO
Industrial Applicability (IA)	Claims 1-45	YES
	Claims NONE	NO

2. Citations and Explanations (Rule 70.7)

Claims 1-45 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the subject matter of the present invention.

Claim 1 relates to a fluorinated copolymer comprising repeating units from at least one fluoroolefin and at least one polycyclic olefin having a formula of (I), the key requirement is at least one of R1-4 is Y, OR5, C(Rf)(Rf')OR5, R6Y or OR6Y as well as if R1 or R3 is OH, then R2 or R4 is not OH or halogen. Claim 19 relates to a photoresist composition comprising the fluorocopolymer of Claim 1 and a photoactive component, Claim 42 relates to a substrate coated with a photoresist composition of Claim 19, while Claim 45 relates to a reaction product of quadricyclane and a fluoroalkylbenzoate compound which is useful as an intermediate for used in Claim 1.

Regarding the limitation of parent Claim 1, Kobo et al. has disclosed a method for the production of a fluorine-containing copolymer comprising at least one fluoroolefin and at least one cyclic unsaturated compound represented by formulas (I) and (II). As pointed out by the Applicants, the formula (II) does not disclose or suggest the claimed cyclobutane structure because it contains an at least 5-membered ring with "l" factor being an integer of 3 or more (see abstract for "l" factor). Additionally, Kobo does not teach or suggest the claimed R1-4 substituents. Brasen only discloses the preparation of polyfluorotricyclic alkenes having the claimed substituents as well as its conversion to polyfluorobutadienes (column 1, line 15-34; column 2, line 21-70; column 9, line 19-28 and 46-54). However, Brasen does not teach or suggest the use for copolymerization or its use related to photoresist.

Regarding the limitation of Claims 6-44, Kobo/Brasen are further silent about using the claimed fluoroalcohol or protected fluoroalcohol groups as well as applying the copolymers in the area of photoresist. Although Allen et al. may teach all the limitations of Claims 6-45 in preparing the claimed fluoropolymers for such an application, Allen cannot fix the deficiency of Kobo and/or Brasen. It is noted that Allen has disclosed using the claimed R1-4 substituents on a compound, which is other than a polycyclic ring compound. With respect to Claim 45, the above-mentioned references do not teach such an adduct compound which is useful as an intermediate for used in Claim 1 as disclosed on page 25-26 of present invention.

In view of the high ring strain on cyclobutane being well known in the art, a polycyclic compound having a cyclobutane ring would behave quite differently from having an at least 5-membered ring.

The two key issues regarding preparing a copolymer using a polycyclic olefin having a formula of (I) which specifically relating to a cyclobutane structure as well as its R1-4 substituents, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

In conclusion, it would not be obvious to a person skilled in the art to arrive at the claimed invention with knowledge from the cited documents. In accordance with the arguments above, the invention claimed in Claims 1-45 is novel; it is considered to involve an inventive step, and it is considered to have industrial applicability.



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